BID SUMMARY
North Railroad Avenue Plume Superfund Site
NPL #NMD986670156
Española, New Mexico

Prepared by:

New Mexico Environment Department
Groundwater Quality Bureau
Superfund Oversight Section
1190 St. Francis Drive Rm. N2300
Santa Fe, New Mexico 87505
Telephone: (505) 827-2911

In association with:

INTERA Incorporated

One Park Square
6501 Americas Parkway NE, Suite 820
Albuquerque, New Mexico 87110
Telephone: (505) 246-1600

December, 2004

PURCHASING DIVISION
P.O. Drawer 26110
SANTA FE, NEW MEXICO 87502-0110
(505) 827-0472

BIDDER:

INVITATION TO BID
CONSTRUCTION CONTRACT

PROJECT: REMEDIATION SYSTEM CONSTRUCTION, NORTH RAILROAD AVENUE PLUME SUPERFUND SITE

PROJECT NO.: 51570939

BID NUMBER: ___50-667-50-00089_____

Sealed bid opening: **Formal**

NM STATE PURCHASING AGENT'S OFFICE

DATE: _2/4/2005__ TIME: 2:00 P.M.

ARCHITECT/ENGINEER OF RECORD:
James P. Joseph, P.E.
INTERA Inc.
One Park Square
Albuquerque, New Mexico 87110
(505) 246-1600

Procurement Specialist:
Kathy Sanchez /(project manager initials)

OWNER:
NEW MEXICO ENVIRONMENT DEPT.
1190 ST. FRANCIS DRIVE RM. N2300
SANTA FE, NM 87505
SABINO RIVERA
Telephone: (505) 827-0387

IMPORTANT: BIDS MUST BE SUBMITTED IN A SEALED ENVELOPE WITH THE BID NUMBER AND OPENING DATE CLEARLY INDICATED ON THE BOTTOM LEFT HAND SIDE OF THE FRONT OF THE ENVELOPE.

SEALED BIDS WILL BE RECEIVED UNTIL THE ABOVE-SPECIFIED DATE AND LOCAL TIME, THEN PUBLICLY OPENED AT THE NEW MEXICO STATE PURCHASING DIVISION OFFICE AND READ ALOUD. HAND DELIVER BIDS TO THE STATE PURCHASING DIVISION, JOSEPH M. MONTOYA BLDG., ROOM 2016, 1100 ST. FRANCIS DR., SANTA FE, NM, 87505.

THIS BID IS SUBJECT TO THE REQUIREMENTS OF THE BIDDING DOCUMENTS AS DEFINED IN THE "INSTRUCTIONS TO BIDDERS," SECTION 00100.

THE BID PROPOSAL FORM MUST BE ACCOMPANIED BY A SURETY BOND, SUBCONTRACTOR LISTING FORM, AND DOCUMENTS SPECIFIED IN THE "INSTRUCTIONS TO BIDDERS."

PLEASE NOTE: All hand-delivered bids must be received at the State Purchasing Division Office and should be submitted at the front desk, Room 2016.

Bidding Documents may be obtained at the office of the Owner upon payment of **$ 50** for each complete set. CHECKS SHOULD BE MADE PAYABLE TO "NMED - GWQB". Incomplete sets will not be issued. The successful Bidder will receive refund of his deposit, and any unsuccessful Bidder who returns the Bidding Documents in good and complete condition within fifteen (15) days of the Bid Opening will also receive refund of this deposit. No deposits will be returned after the fifteen-day period.

BIDDING DOCUMENTS MAY BE REVIEWED AT THE FOLLOWING LOCATIONS:

Architect/Engineer of Record

Builder's News and Plan Room
3435 Princeton Drive NE
Albuquerque, New Mexico 87107
Phone: (505) 884-1752, Fax: (505) 883-1627

Construction Reporter
1609 Second Street NW
Albuquerque, New Mexico 87102
Phone: (505) 243-9793, Fax: (505) 242-4758

Dodge Reports
1615 University Boulevard NE
Albuquerque, New Mexico 87102
Phone: (505) 243-2817, Fax: (505) 842-0231

Reed Construction Data
3351 Candelaria Rd. NE, Suite D
Albuquerque, NM 87107
Phone: (505) 881-8590, Fax: (505)881-2063

Bids shall be presented in the form of a total Base Bid proposal under a Lump Sum Contract plus any additive or deductive alternates that are selected by the Owner. A bid must be submitted on all bid items and alternates; segregated bids will not be accepted. Plans and specifications are available from the Owner.

NOTE: Base Bid price shall not include state gross receipts or local options taxes. Taxes will be included in the Contracted Amount at prevailing rates as a separate item to be paid by Owner.

In submitting this bid, each Bidder must satisfy all terms and conditions of the Bidding Documents.

All work covered by this Invitation to Bid shall be in accordance with applicable state laws and is subject to the minimum wage rate determination issued by the office of the Labor Commissioner for this project.

INVITATION TO BID page 3

Bid Security in the form of a surety bond executed by a surety company authorized to do business in the State of New Mexico in the amount of **5 %** of the total bid, or the equivalent in cash by means of a cashier's check or in a form satisfactory to the Owner, must accompany each bid in accordance with the Instructions to Bidders.

A 100% Performance Bond and a 100% Payment and Materials Bond executed by a surety company authorized to do business in the State of New Mexico shall be required from the successful Bidder prior to award of contract.

A completed Subcontractor Listing Form must accompany each bid.

The Bidding Documents contain a time for completion of the work and further impose liquidated damages for failure to complete the work within that time period.

No Bidder may withdraw his bid for 90 **days** after the actual date of the opening thereof.

The Owner intends to award this Project to the lowest responsible Bidder. The Owner reserves the right to reject any and all bids, to waive technical irregularities, and to award the contract to the Bidder whose bid it deems to be in the best interest of the Owner.

Attention of the Bidder is particularly directed to the current requirements as to Resident Contractor's Preference per Section 13-4-3 NMSA 1978. The provisions of Sections 13-4-1 through 13-4-4 NMSA 1978 are not applicable to projects receiving Federal aid or when the expenditure of Federal funds designated for a specific contract is involved.

Any contract awarded under this contract is expected to be 90% funded by a Cooperative Agreement from the United States Environmental protection Agency (EPA) and the remaining 10% matched by the state of New Mexico. Neither the United States nor any of its departments, agencies, or employees will be a party to the Invitation for Bids or any resulting contract. This procurement will be subject to regulations contained in 40 CFR Part 31, 31, 34 and 35.

This Invitation to Bid may be cancelled, and any and all bids may be rejected, in whole or in part, when it is in the best interest of the State of New Mexico.

The New Mexico Procurement Code, Sections 13-1-28 through 13-1-199 NMSA 1978, imposes civil and misdemeanor criminal penalties for its violation. In addition, the New Mexico criminal statues impose felony penalties for bribes, gratuities, and kickbacks.

A Pre-bid Conference will be held as follows:

DATE: January 6, 2005 TIME: 1:30 p.m.

LOCATION: Harold Runnels Building Auditorium, 1190 St. Francis Drive, Santa Fe, NM 87505

END OF INVITATION TO BID

1.1 SEAR Construction

The discussions in this section provide a narrative that, together with the final drawings, introduces the physical facilities to be built and used for the RA.

1.1.1 Injection System

The injection system will be designed to deliver water, brine, and surfactant solutions into the injection and hydraulic control wells. For the proposed full-scale SEAR, there are three injection and two hydraulic control wells, each requiring approximately from 2 to 5 gpm. The injection system will require a potable water source. In addition, the system will also have backup power generation to account for possible power outages.

The injection system will include separate tanks to store brine and surfactant concentrates. These concentrate tanks will be plumbed into separate flow lines for the injection wells as well as the hydraulic control wells. For the injection wells, the feed will consist of flow from the surfactant and brine tanks. For the hydraulic control wells only brine will be used. In-line mixing will be achieved by the use of mechanical mixers installed in the injection line to ensure sufficient mixing of all the fluids.

Clean frac tanks will be used for storage of brine and surfactant concentrates. Secondary containment will be required for all the tanks used for storing fluids. The appropriate flow into each well will be controlled automatically using a supervisory control and data acquisition system (SCADA), connected to metering pumps and flow meters, with periodic manual bucket testing.

1.1.2 Extraction System

The extraction system will involve the use of electric submersible pumps with appropriate modifications to handle PCE to ensure chemical compatibility. The flow rates from each of the six extraction wells will be approximately 2.5 gpm. The extraction system will be plumbed into the aboveground treatment system with flow into a settling tank for temporary storage and separation of free-phase DNAPL produced during surfactant flooding. The extraction flow rates will also be controlled by the SCADA with periodic bucket testing.

1.1.3 In situ Monitoring System

Monitoring equipment will be used to collect data to gauge SEAR progress and to maintain and refine SEAR system operating parameters. The flow rates into the injection and hydraulic control wells, as well as the flow from the extraction wells, will be monitored using the SCADA system. In addition, water levels will be monitored using pressure transducers in the injection and extraction wells with periodic manual monitoring to ensure that the transducers are calibrated. Effluent concentrations will be monitored from the extraction wells and monitoring wells throughout the SEAR to assess the performance of the SEAR. Constituents to be monitored include PCE, surfactant, and electrolytes.

1.1.4 Supervisory Control and Data Acquisition System

A SCADA system will be used for the overall monitoring, process control, and data collection. The primary functions of the SCADA are system monitoring and alarms, data collection and storage, and activating solenoid valves and pumps. The SCADA system will provide real time system monitoring through graphic and digital displays and will allow system alarm parameters to be set and activated. Site personnel will be notified by pager if one of the specified conditions exists. Data will be automatically logged by the SCADA periodically and stored in a data file. Water levels, flow rates, pH, and temperature are typical logged parameters; the system can also be programmed to log valve positions and pump status if desired. This remedial system will require the SCADA system to activate solenoid valves and pumps to avoid over-filling process tanks should the system fail.

1.1.5 Aboveground Wastewater Treatment System

The treatment of produced fluids will aim to reduce the amount of fluids sent off site for treatment and disposal. The conceptual treatment train involves the following:

- Separation of DNAPL;
- Transformation of surfactant, using alkaline hydrolysis, to 4-methyl 2-pentanol;
- Liquid-liquid extraction, using ITDA to remove 4-methyl 2-pentanol; and
- Air-stripping to remove remaining dissolved PCE.

During the period of peak concentrations, some effluent may be hauled off-site because of inability of this or any other cost-effective system to treat the water adequately. Testing described in Section 5 of this report showed that liquid-liquid extraction can reduce the expected concentrations of 4-methyl 2-pentanol to acceptable levels for discharge to the municipal sewer for almost all of the period of extracting produced water. In addition to treatment process options, INTERA has also provided in the design for injection of treated water into the aquifer. This recycling of water through the SEAR cell will reduce concentrations discharged to the sewer at any given time, by operating the system for a longer period.

1.2 Hot-Spot Bioremediation System Construction

1.2.1 Biotreatment Solutions Injection and recirculation System

The hot-spot bioremediation system will be operated following treatment of the source zone DNAPL with SEAR. The hot-spot treatment system will consist of a portion of the SEAR well field, 21 additional injection wells, and 15 extraction wells installed downgradient of the source zone to Hunter Street (Figure C-4 in Appendix A, Final Drawings). Field pilot testing will be conducted, including tracer studies, to optimize the hydraulic and biochemical aspects of the system. As designed, fourteen extraction wells will provide recirculation, such that the amendments are delivered and dispersed with site ground water rather than potable water. A process flow diagram and a process and instrumentation diagram are shown on Figures P-9 and P-10 in Appendix A, respectively. Amendments will be metered into injection lines with a chemical feed pump and mixed with pumped ground water. The amendment solution will then be routed to a manifold used to split flow to the injection well field. The amendment solution will be injected into each injection well through an open-end drop pipe placed at the approximate midpoint of each well screen. Flow control and monitoring devices will be placed on each injection line so that the flow can be split evenly to all injection wells. A SCADA system will be used to monitor all flow and process functions associated with the hot-spot bioremediation system. Amendments will be stored in aboveground tanks housed in an enclosure staged on the Norge Town property. The enclosure will also house all monitoring systems and the SCADA system.

Based on an analysis of the hydraulics of the hot-spot system, injection flow rates will be approximately 2 to 3 gpm per well. Buried polyethylene piping will be used to route injection water from the system enclosure to the well field.

Because of the uncertainty associated with the rates and mechanisms of biodegradation that will be achieved (see discussion in Section 5.0), INTERA does not recommend that other or expanded systems be designed or constructed at this time. Based on testing of the systems designed herein, other systems to treat larger areas or other hot-spots (as yet not identified) can be designed and constructed later.

1.2.2 In situ Monitoring System

Selected wells from the SEAR well field, the 21 injection wells, and the 15 extraction wells (Figure C-4, Appendix A) will be used to monitor the performance of the bioremediation process over time. Ground water samples will be collected with a submersible pump from the wells at regularly scheduled

intervals and analyzed for VOCs, alternate electron acceptors, volatile fatty acids, and dissolved hydrogen. Because the 15 proposed extraction wells will provide samples of the recirculating water, INTERA does not see the need for additional monitoring wells within the injection well field.

1.2.3 Supervisory Control and Data Acquisition System

A SCADA will electronically monitor the injection of amendment solution. The SCADA will log and store all system parameters, including the injection flow rates, extraction flow rates, and water levels in the well field. The SCADA will be programmed to open and close a series of solenoid valves on a prescribed schedule to allow for the automatic injection of amendment solution. In the event of a power outage or if a monitored parameter strays outside of its operational limits, the SCADA will page the system operator with an alarm code identifying the type of problem. If a critical parameter strays outside of its operational limits (e.g., fluid level in an injection well), the SCADA will automatically shut the system down and will send a page with an alarm code identifying the type of problem to the system operator.

1.3 State Road 201 Bio-Curtain Construction

1.3.1 Biotreatment Solutions Injection System

The State Road 201 bio-curtain will consist of a series of alternating injection and extraction wells installed along State Road 201 perpendicular to the ground water flow path as shown in Figure C-7 in Appendix A. Ground water pumped from an extraction well will flow through a separate line including a flow control valve, pressure indicator, flow meter, and sample port before entering the extraction manifold. Downstream of the extraction manifold, amendments will be metered into the ground water with a chemical feed pump and adequately mixed with an in-line hydrodynamic mixer. After adequate mixing of amendments, amended ground water will be re-injected into the aquifer through the injection wells. Based on a preliminary analysis of the hydraulics of the bio-curtain, injection and extraction flow rates will be approximately 3 and 3.3 gpm, respectively. Buried polyethylene piping will be used to route injection and extraction water from the system enclosure to the well field.

Electric submersible pumps will be used to extract ground water from the subsurface. All storage and injection equipment for biological amendments will be housed in an enclosure along State Road 201.

1.3.2 In situ Monitoring System

The monitoring system for the State Road 201 bio-curtain will consist of a series of nine monitoring wells installed downgradient of the bio-curtain as shown in Figure C-7 in Appendix A. Monitoring well clusters R-04 and R-08 also will be used to monitor the performance of the bio-curtain. Samples will be collected from the monitoring wells and the injection extraction wells to monitor the performance of the bioremediation system over time. One important goal of the monitoring system will be to ensure that the barrier is continuous and effective contact of amendments with contaminants is achieved. Ground water samples will be collected from the injection and extraction wells using the existing manifold system, while samples will be collected manually from the monitoring wells with a submersible pump. Samples will be analyzed for VOCs, alternate electron acceptors, volatile fatty acids, and dissolved hydrogen.

1.3.3 Supervisory Control and Data Acquisition System

A SCADA system will electronically monitor and control the injection and extraction wells for the recirculation system. The SCADA will log and store all pertinent system parameters, including the injection and extraction flow rates and water levels in the well field. The SCADA will be programmed to open and close a series of solenoid valves and turn on and off a series of centrifugal pumps on a prescribed schedule to allow for the automatic injection of electron donor. In the event of a power outage or if a monitored parameter strays outside of its operational limits, the SCADA will page the

system operator with an alarm code identifying the type of problem. If a critical parameter falls out of range (e.g., fluid level in an injection or extraction well), the SCADA will automatically shut the system down and will send a page to the system operator with an alarm code identifying the type of problem.

1.4 Deep Zone Bioremediation System Construction

1.4.1 Biotreatment Solutions Injection System

Amendment solution will be injected into the deep aquifer system through direct injections using mobile, operator-attended equipment at existing monitoring wells R-09(D2), R-12(D1), R-15(D1), R-20 (D1), and R-21 (D1), and two new injection cluster wells (see Figure C-12 in Appendix A). Because the Deep Zone plume covers such a large area (10 to 20 acres) and uncertainty remains concerning the exact direction of ground water flow in the Deep Zone, INTERA proposes to rely on the direct injection of biotreatment solutions followed by the dispersive mixing of amendments with contaminated ground water through the natural ground water flow. New monitoring wells have been designed to assess hydraulic and biochemical processes that will occur as a result of the injection of amendments.

Amendment injections will be conducted with a mobile injection system that can be moved between injection wells. The unit will be trailer-mounted and will consist of a tank for amendment storage, mixing apparatus, an injection pump, flow control and monitoring devices, sampling ports, and associated valves and meters. Prior to injection, dilute amendment solution will be prepared by mixing stock amendment solutions with potable water in aboveground tanks. Once the amendment solution is prepared, it will be injected into wells with the use of a centrifugal pump.

Due to the uncertainties in hydrogeology and contaminant distributions in the Deep Zone, the Deep Zone bioremediation system will be conducted in a phased approach. Injection will begin at one injection well (most likely R-21 (D1)), and its performance will be monitored through the collection and analysis of ground water samples from monitoring wells to be installed in close proximity to the injection well. As part of long-term RA, data collected from the first injection phase will be used to determine the optimum injection rates, the injection time periods, the spacing of injection and monitoring wells, and the optimum formulation of amendments for the remaining injection wells. It is likely that active dispersal of amendments (i.e. recirculation) will be designed and implemented for the Deep Zone, after the initial steps described in this section produce a more firm basis for design.

1.4.2 In situ Monitoring System

The monitoring system for the Deep Zone bioremediation system will consist of the previously mentioned injection wells and the existing Deep Zone monitoring well system shown on Figure C-12 in Appendix A. Ground water samples will be collected at prescribed time intervals and analyzed for VOCs, alternate electron acceptors, volatile fatty acids, and dissolved hydrogen.